

Lorena Pedraza *, Javier Larragoiti, Andrés Zanela, María Bolívar, Rubén Moreno-Terrazas.

Universidad Iberoamericana A.C., Prol. Paseo de la Reforma 880, Lomas de Santa Fe, C.P. 01210, México, D.F., Fax: (55) 5950.4279

*E-mail: lorena.pedraza@uia.mx

Introduction

Lignocellulosic material is an important source of monosaccharides that can be fermented to ethanol, xylitol and others compounds in a biorefinery¹. There are different enzyme cocktails used to hydrolyze structural components of biomass; however the use of supplements like xylanase and pectinase can improve the process.

Solid organic waste from food supply center of Mexico City (Central de Abasto) has a diverse microbial population, with xylanase, pectinase and ligninolytic activities. These enzymes can be applied to biomass hydrolysis, in order to increase fermentable sugar yield.

Objectives

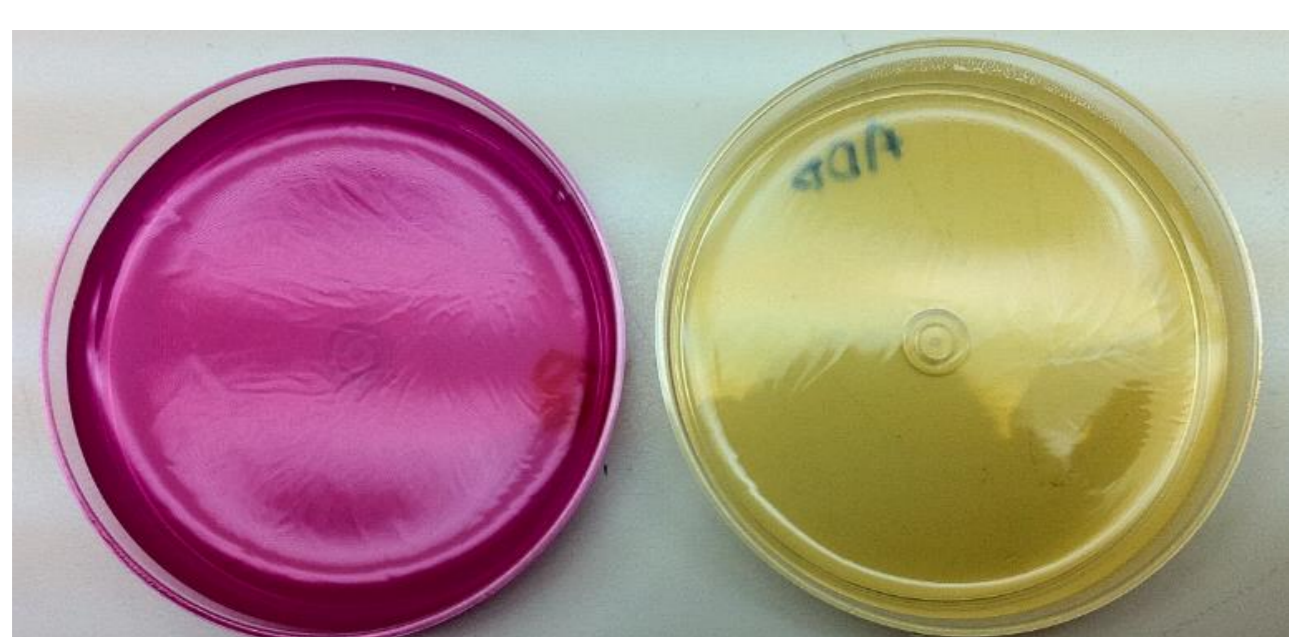
The aim of this work is the isolation and identification of microorganisms with hydrolytic activity over the structural polymers.

Methods

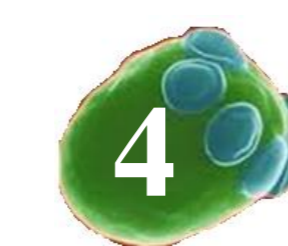
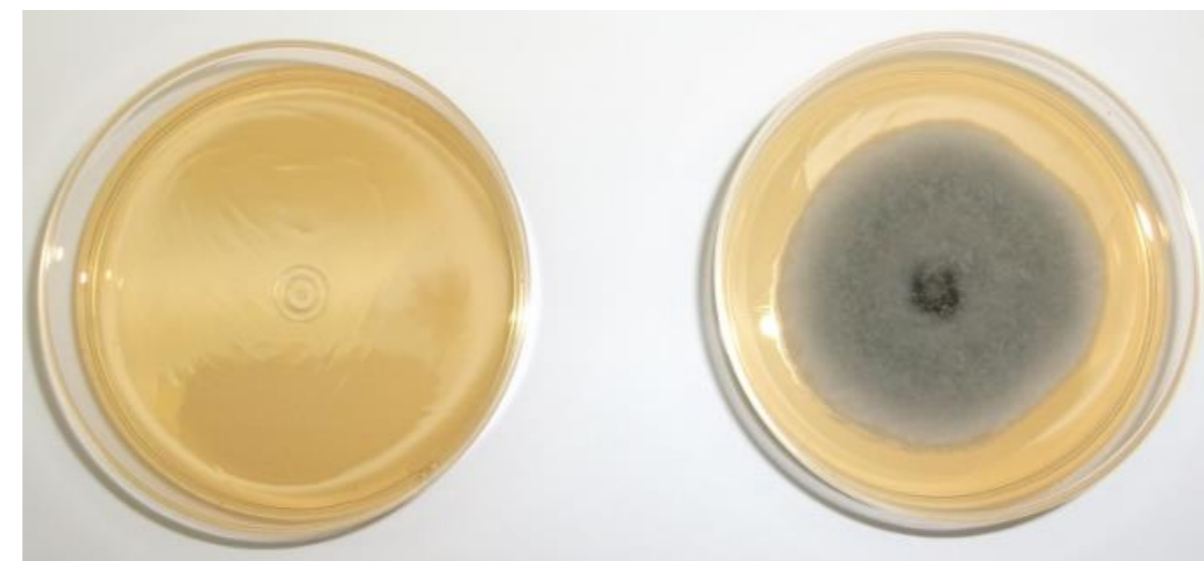
- 1 Residue sample (1 g) was diluted in saline solution (100 mL).



- 2 Serial dilutions were inoculated in Petri dishes with PDA and RBDCA media.



Then the colonies were transferred to solid media with pectin, xylan or lignin as sole carbon source in order to select and differentiate which yeasts were more capable of growing in a specific or in diverse media by producing different hydrolytic enzymes^{2,3}.



Strains were purified and identified by morphologic, physiologic and molecular tests, by mean rDNA sequencing, of D1/D2 region of 26S gene.



Results and Discussion

Table 1 shows yeasts with different enzymatic activities.

Table 1. Yeasts growth capacity in different media with diverse carbon source (G=growth, L=deficient growth, n.a.=not available)

Yeasts	Xylan	Pectin	Lignin
Geotrichum candidum (a)	G	G	G
Geotrichum candidum (b)	G	G	G
Galactomyces geotrichum (c)	G	L	L
Geotrichum candidum (d)	G	G	G
Geotrichum candidum (e)	G	L	G
Geotrichum candidum (f)	G	G	n.a
Geotrichum candidum (g)	-	G	n.a
Geotrichum candidum (h)	G	-	n.a
Acremonium cf zeae (i)	G	-	n.a
Geotrichum candidum (j)	-	G	n.a

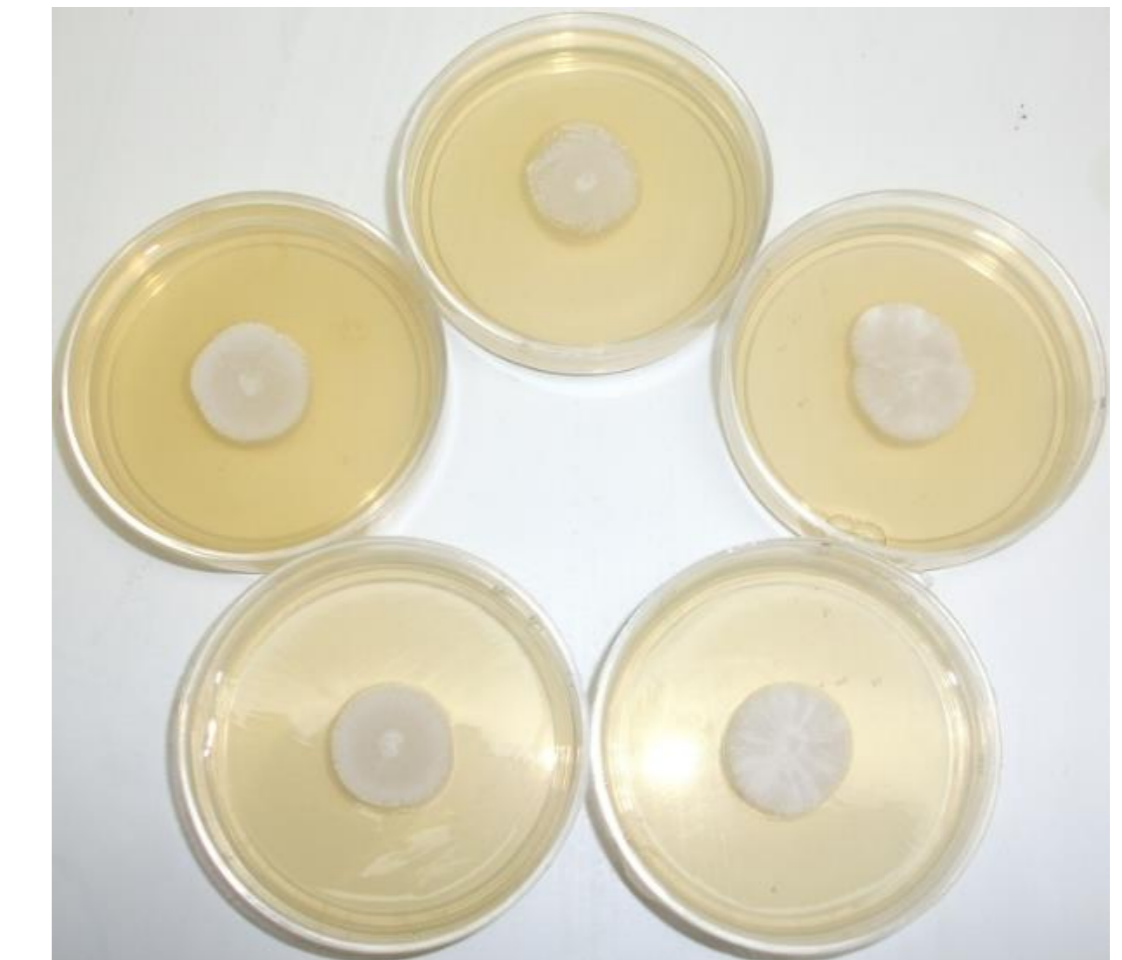


Figure 1. From upper center clockwise, yeasts a,b,c,d,e grown in pectin media

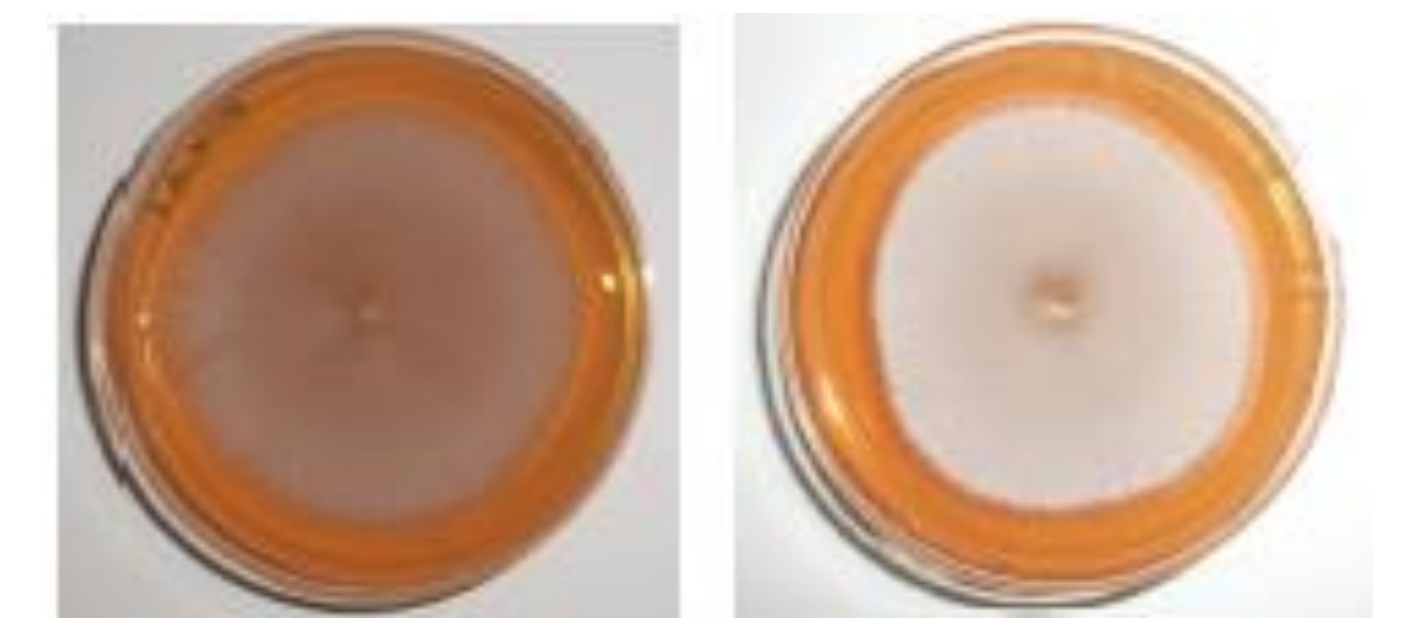


Figure 2. Yeast b (left) and yeast d (right) grown in lignin media.

Conclusions

An important number of microorganisms with hydrolytic activity have shown to grow accurately in different media with diverse carbon sources.

The isolated yeast strains presented in this work produce xylanases, pectinases and ligninases which are important for further research in which these enzymes can be extracted and purified.

It is important to remark that with simple tests, like the one presented in this work, diverse yeasts can be proved for their enzymatic activity.

Acknowledgments

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References

1. Demirbas, A.(2010). Biorefinery. *Biorefineries*. Springer. United Kingdom. 75-91.
2. Rebollido, R (2008). Microbial populations during composting process of organic fraction of municipal solid waste. *Appl ecol. and env.research*. 6(3): 61-67.
3. Sidkey, N.M. (2010). Screening of Microorganisms Isolated from some Enviro-Agro-Industrial Wastes in Saudi Arabia for Amylase Production. *J. of Am. Sci*. 6(10) 926-939.